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January 25, 2008 CDM Project File: 5000-55353

Ms. Ana Townsend
California Regional Water Quality Control Board - Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Subject: **Transmittal – Revised Monitoring and Reporting Program No. CI-9310**
Order No. R4-2007-0040
Boeing Corporate Real Estate
Former C-6 Facility, 19503 South Normandie Avenue, Los Angeles, California
File No. 95-036; SLIC No. 410; Site ID No. 1846000

Dear Ms. Townsend:

Camp Dresser & McKee Inc. (CDM), on behalf of Boeing Corporate Real Estate (CRE) (formerly Boeing Realty Corporation), is hereby submitting the above-referenced revised Monitoring and Reporting Program (MRP) to the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) for the Former C-6 Facility in Los Angeles, California (Site). The purpose of this revised MRP is two-fold:

- Incorporate modifications to the Building 1/36 pilot biorecirculation test MRP due to proposed changes to the pilot test operation. These proposed changes were based on the results of the recent well redevelopment and aquifer performance testing (APT) as indicated in the document titled "*Addendum No. 2 to Building 1/36 (Parcel C) Source-Area Groundwater In-Situ Reactive Zone Pilot Study Workplan (Work Plan), Request to Include Well WCC_06S as a Contingency Extraction Well*" (CDM, January 11, 2008).

- Incorporate <u>new</u> monitoring and reporting requirements resulting from the proposed bioremediation amendment injections in existing C-Sand wells at Building 2 area of the Site. The scope of the Building 2 C-Sand amendment injections is being documented in an addendum (Addendum No. 2, CDM, January 21, 2008) to the document titled "*Building 2 In-Situ Reactive Zone Pilot Test Workplan*" (ARCADIS G&M, Inc., August 15, 2001) to be provided under a separate cover.

The proposed key changes to the Building 1/36 MRP are summarized below:

- Group A and B sampling points have been split into Groups A1 and A2 and Groups B1 and B2, respectively. Due to the lower than anticipated flow from extraction well EWB001 (CDM, January 11. 2008), Group A1 sampling points are amendment points where donor is planned to be introduced initially. Group A2 sampling points are backup amendment points where donor could be introduced in the event of higher flow from EWB001 or addition of another extraction well (to be decided based on evaluation of system operation). Similarly when donor is introduced in Group A1 wells, only Group B1 wells will be monitored. When donor is introduced in Group A1 and Group A2 wells, then all Group B wells (B1 and B2) will be monitored.

- Elimination of nitrite and nitrate analyses from all the wells, as these data are not necessary to monitor the performance of the amendment injections

- Elimination of the following analysis from Group A and B performance monitoring wells after the first year following injections: volatile fatty acids (VFAs), alkalinity, ferrous iron, anions (sulfate and chlorides), and bacterial DNA analysis by Quantitative Polymerase Chain Reaction test (qPCR). These analyses are not expected to be required to monitor the performance of the biorecirculation pilot test beyond the first year. From a bioremediation perspective, monitoring that would be still required in Group A and B wells after Year 1 are: chlorinated volatile organic compounds (VOCs), dissolved hydrocarbon gases (methane, ethane, and ethene), and total organic carbon (TOC).

  It should be noted that monitoring of all the above-mentioned analyses will still be continued on a semi-annual basis after Year 1 for Group C (downgradient) and D (upgradient) wells to document potential migration of donors/carbon sources, cultures and by products of the remediation process beyond the "treatment zone" per the WDR Permit requirements.

If you have any questions or concerns regarding this document, please call Robert Scott at (562) 497-6176 or Joe Weidmann at (805) 563-8600.

Very truly yours,

Ravi Subramanian

Ravi Subramanian, P.E
Principal

Attachments

Cc: Robert Scott, The Boeing Company
Joe Weidmann, Haley & Aldrich, Inc.

STATE OF CALIFORNIA
CALIFORIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-9310
FOR
BOEING CORPORATE REAL ESTATE
(formerly BOEING REALTY CORPORATION)
FORMER C-6 FACILITY

FILE NO. 95-036

The Discharger shall implement this monitoring and reporting program on the effective date of this Order.

I. GROUNDWATER MONITORING PROGRAM

The Building 1/36 biorecirculation pilot test was initiated in the First quarter of 2008 and Building 2 periodic slug injections are planned to be initiated in the Second quarter of 2008. The following groundwater wells and amendment points will be included in the sampling program:

Building 1/36 Biorecirculation Pilot Test

Group A
- Group A1: AW0066UB and AW0067UB
- Group A2: AW0064UB and AW0065UB

Group B
- Group B1: AW0075UB, AW0076UB, AW0077UB, EWB002, and AW0073C
- Group B2: WCC_06S and AW0074UB

Group C: TMW_07 and WCC_12S
Group D: AW0055UB

Building 2 Periodic Slug Injections

Group A: IRZC001, and IRZC0003 through IRZC0020
Group B: CMW026, IRZCMW003, IRZCMW002 and MWC024
Group C: CMW002
Group D: IRZCMW001

Groundwater well and amendment point locations at the Site that will be used for the Building 1/36 pilot test is shown on attached Figure 1 and on attached Figures 2 and 3 for the Building 2 periodic slug injections. Group A sampling points are amendment points where donor will be introduced. Due to the lower than anticipated flow from extraction well EWB001, Group A1 sampling points are amendment points where donor is planned to be introduced initially. Group A2 sampling points are backup amendment points where donor could be introduced in the event of higher flow from EWB001 or addition of another extraction well (to be decided based on evaluation of system operation). Group B wells consist of monitoring wells that are located

within the treatment zone, and will be used to: evaluate electron donor consumption and distribution; and the effectiveness of the biologically active zones over time. For the Building 1/36 pilot test, all Group A and B wells will be used for performance monitoring purposes as follows:

- When donor is introduced in Group A1 wells, only Group B1 wells will be monitored per the table below.
- When donor is introduced in Group A1 and Group A2 wells, then all Group B wells (B1 and B2) will be monitored per the table below.

For the Building 2 periodic slug injections, only Group B wells will be used for performance monitoring purposes, as Group A wells are not exposed to surface and therefore are not accessible for sampling. The Group C sampling points are downgradient sample locations, and Group D points are upgradient sample locations.

Baseline sampling will take place prior to injection and will include at least one event for the Building 1/36 pilot test and the Building 2 periodic slug injections. The samples will be analyzed for field parameters (oxidation-reduction potential [ORP], dissolved oxygen [DO], pH, specific conductance, temperature, turbidity and groundwater elevation), chlorinated volatile organic compounds (VOCs), dissolved hydrocarbon gases (methane, ethane, and ethene), total organic carbon (TOC), volatile fatty acids (VFAs), alkalinity, ferrous iron by field kit, anions (sulfate and chlorides), and bacterial DNA analysis by Quantitative Polymerase Chain Reaction test (qPCR). If a tracer test is conducted, samples will be analyzed for bromide too.

The required constituents to be analyzed and the monitoring schedule for each sample group for the Building 1/36 pilot test and periodic slug injections at Building 2 are shown below.

CONSTITUENT	UNITS	TYPE OF SAMPLE	MINIMUM FREQUENCY OF ANALYSIS – BUILDING 1/36 PILOT TEST	MINIMUM FREQUENCY OF ANALYSIS – BUILDING 2 SLUG INJECTIONS
Total Daily Injections	Liters or Gallons	Measurement	Per injection	Per injection
Groundwater Elevation	Feet below ground surface (bgs)	In situ	**Groups A1 and B1 OR A and B**: Baseline, monthly following injection for first six months, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups A1 (or A))-D**: Semi-annually after Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection , quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups B-D**: Semi-annually after Year 1
Field Parameters (DO, ORP, pH, Temperature, Specific Conductance, and Turbidity)	mg/l, millivolts, pH units, degrees C, µS/cm, and NTU, respectively	Grab	**Group A1 OR A**: Baseline and quarterly post injection for Year 1 **Group B1 OR B**: Baseline, monthly following injection for first six months, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups A1 (or A)-D**: Semi-annually after Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Group B-D**: Semi-annually after Year 1
Chlorinated Volatile Organic Compounds (EPA Method 8260B)	µg/l	Grab	**Group A1 OR A**: Baseline and quarterly post injection for Year 1 **Group B1 OR B**: Baseline, monthly following injection for first six months, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups A1 (or A)-D**: Semi-annually after	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups B-D**: Semi-annually after Year 1

			Year 1	
Total Organic Carbon (EPA Method 9060 Modified or equal)	mg/l	Grab	**Group A1 OR A**: Baseline and quarterly post injection for Year 1 **Group B1 OR B**: Baseline, monthly following injection for first six months, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups A1 (or A)-D**: Semi-annually after Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Group B-D**: Semi-annually after Year 1
Volatile Fatty Acids	mg/l	Grab	**Group A1 OR A**: Baseline and quarterly post injection for Year 1 **Group B1 OR B**: Baseline, monthly following injection for first six months, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups A and B**: No analysis for Year 2 **Groups C and D**: Semi-annually after four Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Group B**: No analysis for Year 2 unless additional injections are conducted **Groups C and D**: Semi-annually after Year 1
Dehalococcoides spp. strains (Quantitative Polymerase Chain Reaction test [qPCR])	gene copies/mL	Grab	**Group A1 OR A**: Baseline and semi-annually post injection for Year 1 **Group B1 OR B**: Baseline, quarterly following injection for first six months, semi-annually for rest of Year 1 **Groups C and D**: Baseline and Semiannually for Year 1 **Groups A and B**: No analysis for Year 2 **Groups C and D**: Semi-annually after Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and semi-annually for Year 1 **Group B**: No analysis for Year 2 unless additional injections are conducted **Groups C and D**: Semi-annually after Year 1
Dissolved Metals (Ferrous Iron by field kit), Alkalinity, and Anions (sulfate, nitrate, nitrite and chlorides)	mg/l	Grab	**Group A1 OR A**: Baseline and quarterly post injection for Year 1 **Group B1 OR B**: Baseline, monthly following injection for first six months, and quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for rest of Year 1 **Groups A and B**: No analysis for Year 2 **Groups C and D**: Semi-annually only for chlorides after Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Group B:** No analysis for Year 2 unless additional injections are conducted **Groups C and D**: Semi-annually only for chlorides after Year 1
Total Dissolved Solids (TDS)	mg/l	Grab	**Groups C and D**: Quarterly following injection for Year 1, semi-annually after Year 1	**Groups C and D**: Baseline, quarterly following injection for Year 1, semi-annually after Year 1
Dissolved Hydrocarbon Gases (ethane, ethane, and methane)	mg/l	Grab	**Group A1 OR A**: Baseline and quarterly post injection for Year 1 **Group B1 OR B**: Baseline, monthly following injection for first six months, and quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for rest of Year 1 **Groups A1 (or A)-D**: Semi-annually after Year 1	**Group B**: Baseline, Month 1 and Month 3 following injection, quarterly for rest of Year 1 **Groups C and D**: Baseline and quarterly for Year 1 **Groups B-D**: Semi-annually after Year 1

All groundwater monitoring reports must include, at minimum, the following:

a. Well identification, date and time of sampling;
b. Sampler identification, and laboratory identification; and
c. Semi-annual observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

II. AMENDMENT INJECTION MONITORING REQUIREMENTS

The reports shall contain the following information regarding injection activities:

1. Depth of injection points;

2. Quantity of amendment injected and dates injected; and

3. Total amount of amendment injected.

III. REPORTING REQUIREMENTS

The first monitoring report for Building 1/36 pilot test under this Program was due 30 July 2007. The first monitoring report for Building 2 periodic slug injections under this Program is due by 30 July 2008. This monitoring and reporting program supercedes previous requirements stated in work plan approval letters. The monitoring and reporting program provided herein for Building 2 periodic slug injections may change based on when injections are actually initiated. Any such changes will be provided in a revised monitoring and reporting program.

The Discharger is required to submit a final report including baseline and donor injection data, plus quarterly and semi-annual reports (as provided below) for the duration of the Building 1/36 pilot test and Building 2 periodic slug injections. If necessary, semi-annual monitoring reports will be submitted for each additional year. The groundwater monitoring wells and amendment points will be gauged and sampled, and results will be reported to the Regional Water Quality Control Board (Regional Board) under this Monitoring and Reporting Program according to the following schedules:

Building 1/36 Pilot Test

Reporting Period	Sampling Month(s)	Report Due Date
April – June 2007	May and June 2007 (Baseline Events)	July 30, 2007
July – September 2007	None (No injections performed)	October 30, 2007
October – December 2007	December 2007 (2nd Baseline Event for EWB002)*	January 30, 2008
January – March 2008	January, February, and March 2008	April 30, 2008
April – June 2008	April, May, and June 2008	July 30, 2008
July – December 2008	August and November 2008**	January 30, 2009
January – June 2009	May 2009	July 30, 2009
June – December 2009	November 2009	January 30, 2010

* - Building 1/36 pilot test was started up on December 17, 2007 and operated until December 21, 2007. Electron donor was injected as part of the startup operations. The first monthly sampling event associated with the pilot test will be performed in January 2008.
** - Sampling schedules were slightly modified to match up with Building 2 sampling events

Building 2 Periodic Slug Injections

Reporting Period	Sampling Month(s)	Report Due Date
January – June 2008	March or April 2008 (Baseline Event) June 2008 (Month 1)*	July 30, 2008
July – September 2008	August 2008 (Month 3)	October 30, 2008
October 2008 – March 2009	November 2008 and February 2009	April 30, 2009
April – September 2009	May 2009	October 30, 2009
October 2009 – March 2010	November 2009	April 30, 2010
April – September 2010	May 2010	October 30, 2010

* - The first round of sampling for Building 2 will be initiated in the month following the completion of the initial round of slug injections (expected to be completed by May 2008).

The Discharger shall submit Reports detailing the results of the Building 1/36 pilot test and Building 2 periodic slug injections. Where the reporting deadlines for Building 1/36 and 2 falls on the same dates, one single report combining the activities at both areas should be submitted. The reports should include an evaluation of the effectiveness of using the amendment solution to remediate VOC-contaminated groundwater at the Site, the impact of any by-products on the receiving groundwater quality, and any other effects the *in situ* treatment may have. The Discharger is required to submit the following reports pursuant to their respective due dates:

Building 1/36 Pilot Test

Report	Due Dates
Final Report	January 30, 2010

Building 2 Periodic Slug Injections

Report	Due Dates
Final Report	October 30, 2010

If there is no discharge or injection during any reporting period, the report shall so state. Monitoring reports must be addressed to the Regional Board, Attention: Information Technology Unit.

Whenever wastes associated with the discharge under this Order are transported to a different disposal site, the following shall be reported in the monitoring report: type and quantity of wastes; name and address of the hauler (or method of transport if other than by hauling); and location of the final point(s) of disposal.

IV. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

> "I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information

submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____day of _____ at _____.

_____(Signature)

_____(Title)"

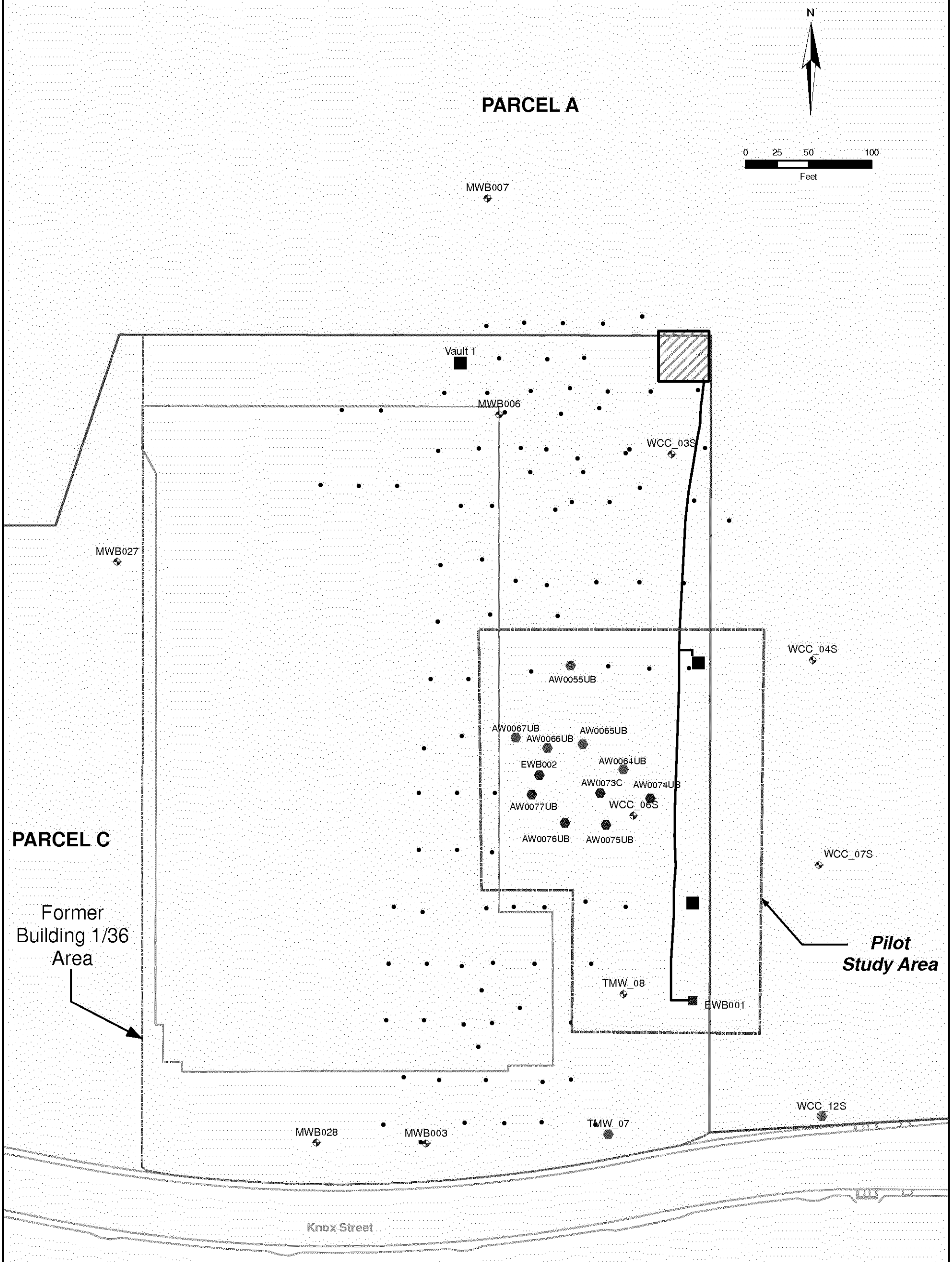
V. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

These records and reports are public documents and shall be made available for inspection during normal business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region.

Ordered by: _____ Date: _____
Executive Officer

NOTE:
1. Existing well vaults and conveyance piping, as shown, will be used to transport extracted groundwater to the treatment compound and amended water back to select amendment wells.
2. A limited subset of the existing amendment and monitoring wells will be used for the pilot study.



January 11, 2008

Legend

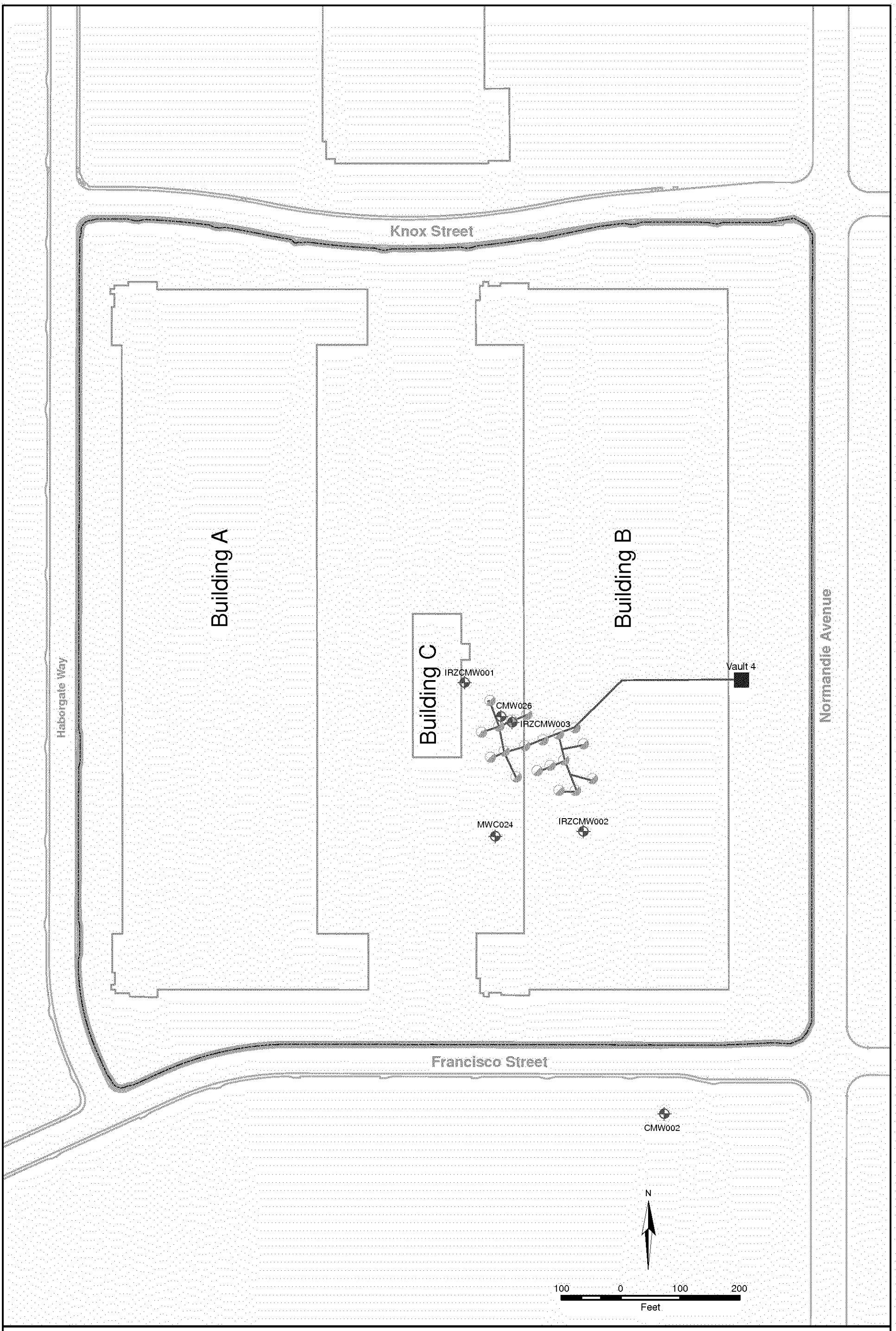
- Parcel Boundary
- Existing Compound
- Existing Vault
- Existing Electrical Conduit and Water Piping
- B-Sand Amendment Well
- B-Sand Extraction Well
- B-Sand Monitoring Well
- Group A Amendment Well (Upper B-Sand)
- Group B Monitoring Well ((6) Upper B-Sand and (1) C-Sand)
- Group C Downgradient Well (B-Sand)
- Group D Upgradient Well (Upper B-Sand)

CDM

Figure 1

Boeing Corporate Real Estate
Former C-6 Facility

Building 1/36 Biorecirculation Pilot Study Well Layout



January 13, 2008

Legend

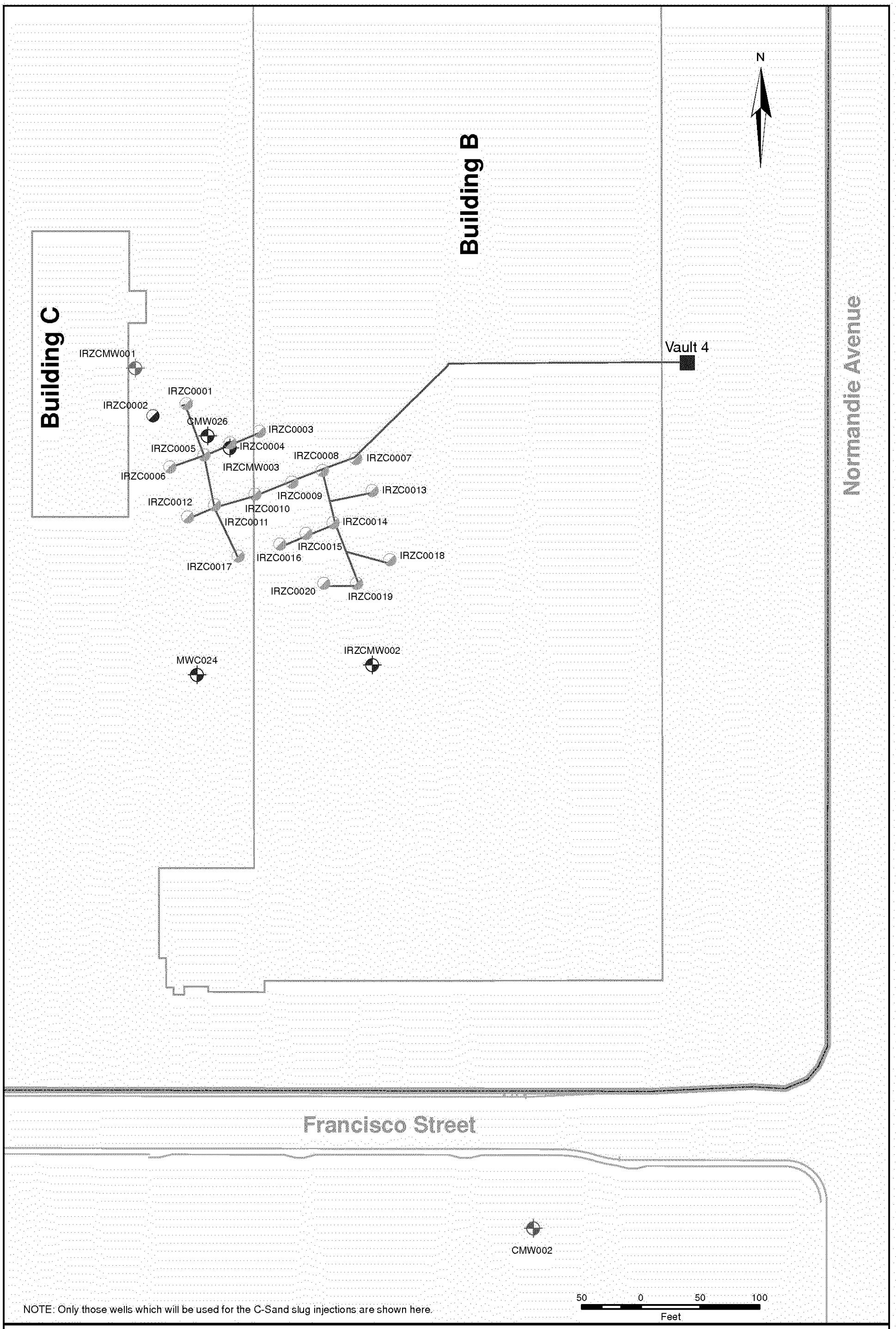
- Vault
- Existing C-Sand Monitoring Well
- Existing C-Sand Injection Wells
- Underground Pipeline
- Site Boundary

CDM

Figure 2

Boeing Corporate Real Estate
Former C-6 Facility

Location Map
C-Sand Wells of Interest
Former Building 2


N
Building B
Building C
Normandie Avenue
Francisco Street
Vault 4
IRZCMW001
IRZC0001
IRZC0002
CMW026
IRZC0003
IRZC0004
IRZC0005
IRZCMW003
IRZC0006
IRZC0008
IRZC0007
IRZC0009
IRZC0013
IRZC0012
IRZC0010
IRZC0011
IRZC0014
IRZC0015
IRZC0016
IRZC0018
IRZC0017
IRZC0020
IRZC0019
IRZCMW002
MWC024
CMW002
50 0 50 100
Feet
NOTE: Only those wells which will be used for the C-Sand slug injections are shown here.
January 13, 2007
Legend
Site Boundary
Underground Pipeline
Vault
C-Sand Amendment Wells (Abandoned)
C-Sand Group A Wells (Amendment Injection)
C-Sand Group B Wells (Treatment Zone Monitoring)
C-Sand Group C Wells (Downgradient Monitoring)
C-Sand Group D Wells (Upgradient Monitoring)
CDM
Figure 3
Boeing Corporate Real Estate
Former C-6 Facility
Amendment and Monitoring Well Layout
Proposed C-Sand Slug Injections at
Vault 4 - Former Building 2